

# STS-107 ESD SYSTEMS SHIFT REPORT

DAY 3 SHIFT 3

GMT 019/09:00

Energy Division Subsystems (MPS, RCS, OMS, FC/PRSD, APU, and Hydraulics) continue to function satisfactorily with the following notes or exceptions.

## OMS/RCS

	Left		Right		Forward	
	Oxidizer	Fuel	Oxidizer	Fuel	Oxidizer	Fuel
PFS %	85.6	85.6	85.4	85.2	72.4	69.4
Interconnect Usage	0.000		0.000			

## ORBIT

1. The left OMS crossfeed zone 1 A heater thermostat began to dither at approximately 017/03:00 GMT. It is clear that the zone 1 A heater is operating because the associated temperature (V43T6218A) is being maintained at approximately 60.5oF. Otherwise the crossfeed heater system is performing nominally and without the thermal crosstalk noted during the last flight of this orbiter (corrected by modifications to the heater system since STS-109).
2. Crossfeed Line Repress using the LOMS B crossfeed valves, occurred at 018/03:58 GMT.
3. On a previous shift (overnight last night), MOD/Prop noted that the Left OMS GN2 Accumulator pressure (V43P4549C) was dropping at approx. 0.1 psi/hr (see attached first plot, ~017/05:00 GMT). They were concerned this could be a leak, especially since prior to OV-102's OMDP, this engine had a "phantom" GN2 leak. (The GN2 package on this engine was removed and replaced with a different GN2 package during OMDP. No leak was noted during the last flight of this orbiter.) Since the original report last night, the accumulator pressure has stabilized (after ~018/06:00 GMT, see first plot). The pressure drop appears to have been caused by the thermal environment of the accumulator. As shown in the first plot, the pressure drop follows the temperature drop reflected in the left engine ox valve and left OMS fuel injector temperatures (V43T4641A and V43T4643A, respectively); the pressure cycling corresponds to the engine cover heater cycling (V43T4720A). The temperature drop was expected since this is currently the cold side of the orbiter.

OMS/RCS Engineering has run PVT quantity calculations for the LOMS GN2 accumulator (see second plot). Since the GN2 accumulator does not have its own temperature transducer, the accumulator quantity must be computed using the engine ox valve temperature (V43T4641A), engine cover temperature (V43T4720A), or the average of the two. As shown on the second plot, the initial leak rate (based on the engine cover temperature) was 4.6 scch, eventually leveling out at approximately 0.4 scch. Using the engine valve temperature, the leak rate is negligible. Even if this were truly a leak, at this point the measured rates are much lower than the OMRSD limit of 30 scch. No action is required at this time.

#### Data Review

1. OMS and RCS system data has been reviewed up through 018/22:30 GMT. System performance continues as expected with no anomalies noted.
2. All vernier jet firing through 018/19:38:58.1 GMT have been reviewed. There have been no anomalous pulses.

RCS PRESSURIZATION LEG FRCS: A      LRCS: A      RRCS: A

23 of 38 primary thrusters have been fired. No new primary thrusters have been fired since the previous report:

F1F	L1A X	R1A X
F2F	L3A X	R3A X
F3F	L1L	R1R
F1L	L2L	R2R
F3L X	L3L X	R3R X
F2R	L4L	R4R
F4R X	L1U X	R1U X
F1D X	L2U	R2U
F2D X	L4U	R4U
F3D X	L2D X	R2D X
F4D X	L3D X	R3D X
F1U X	L4D X	R4D X
F2U X		
F3U X		

John Norris  
ESD Team Lead

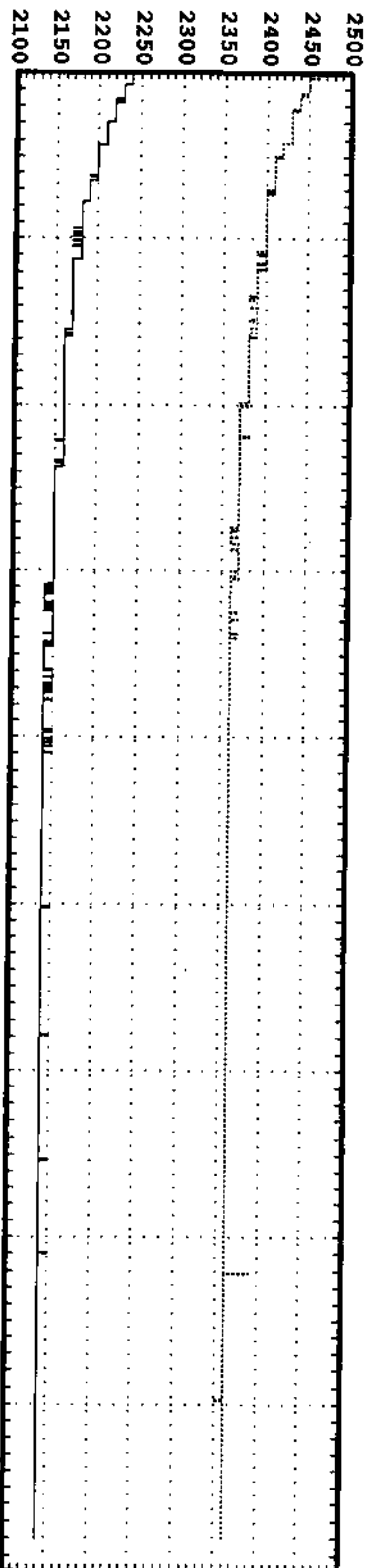
# LEFT OME GN2 CALC INPUT PARAMETERS

M E W S	SAMPLE RATE: 120 (sec/sample)	Subsystem: cms
FORMAT: GN2 CALC INPUT	DATA: GN2 ACCUM	Flight: STS-107

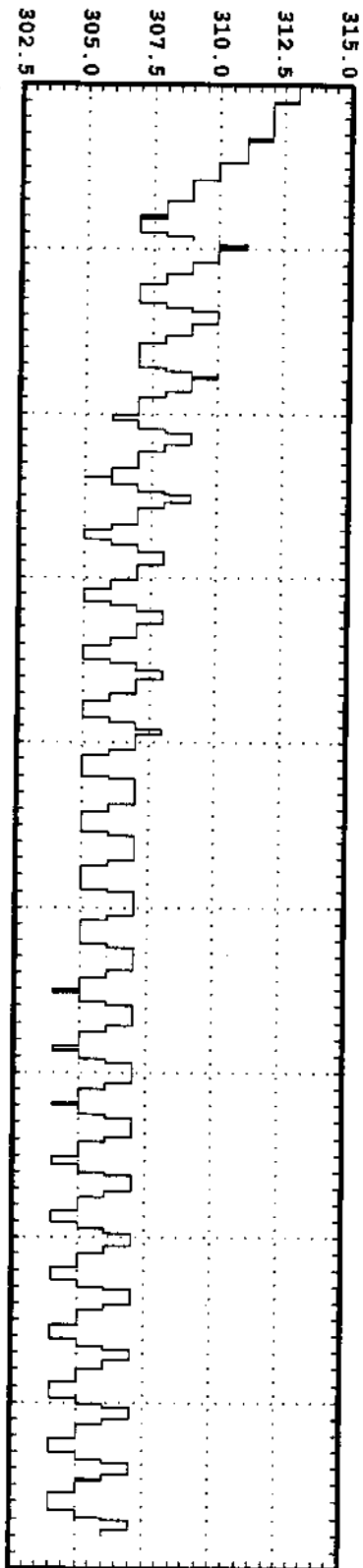
1-OMS-1 ENG PNEU SUPPLY PRESS 1

2-OMS-1 ENG PNEU SUPPLY PRESS 2

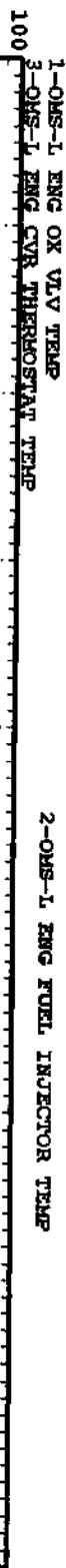
V43P4547C
PSIA
V43P4548C
PSIA



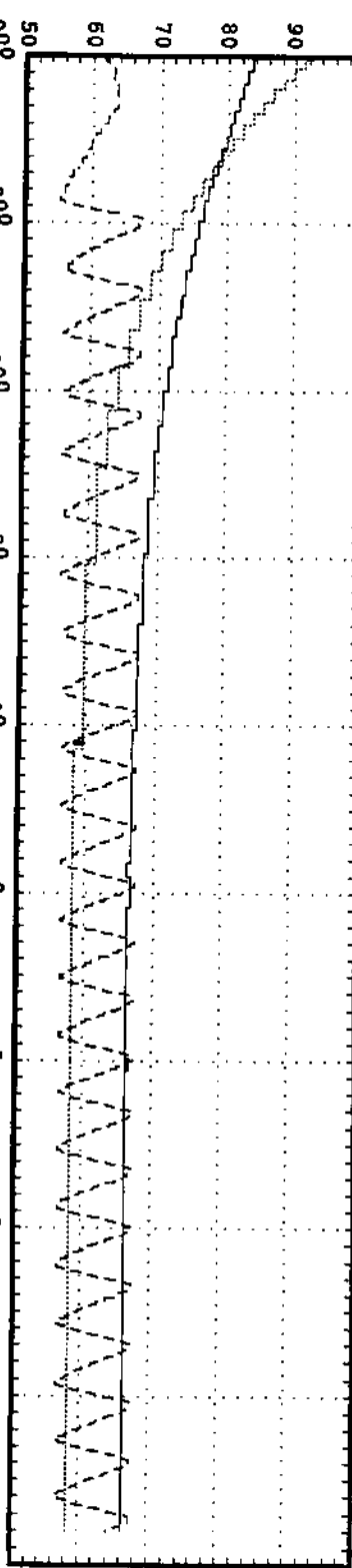
V43P4549C
PSIA



V43T4641A
DECF
V43T4643A
DECF
V43T4720A
DECF



2-OMS-1 ENG FUEL INJECTOR TEMP



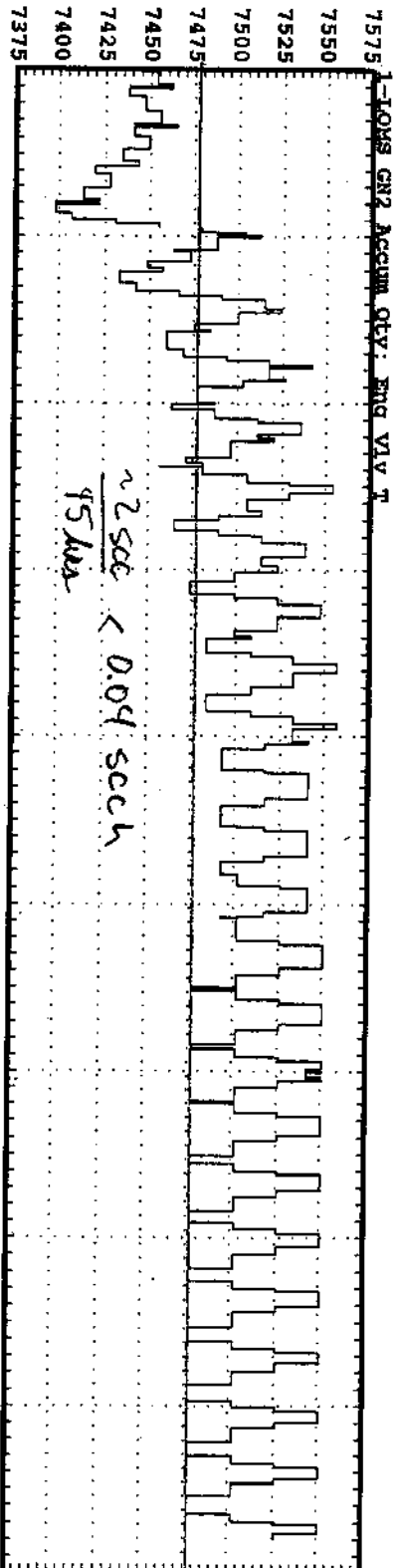
GMT

2003-017:00:00:00.000 2003-017:05:00:00.000 2003-017:10:00:00.000 2003-017:15:00:00.000 2003-017:20:00:00.000 2003-018:01:00:00.000 2003-018:06:00:00.000 2003-018:11:00:00.000 2003-018:16:00:00.000 2003-018:21:00:00.000

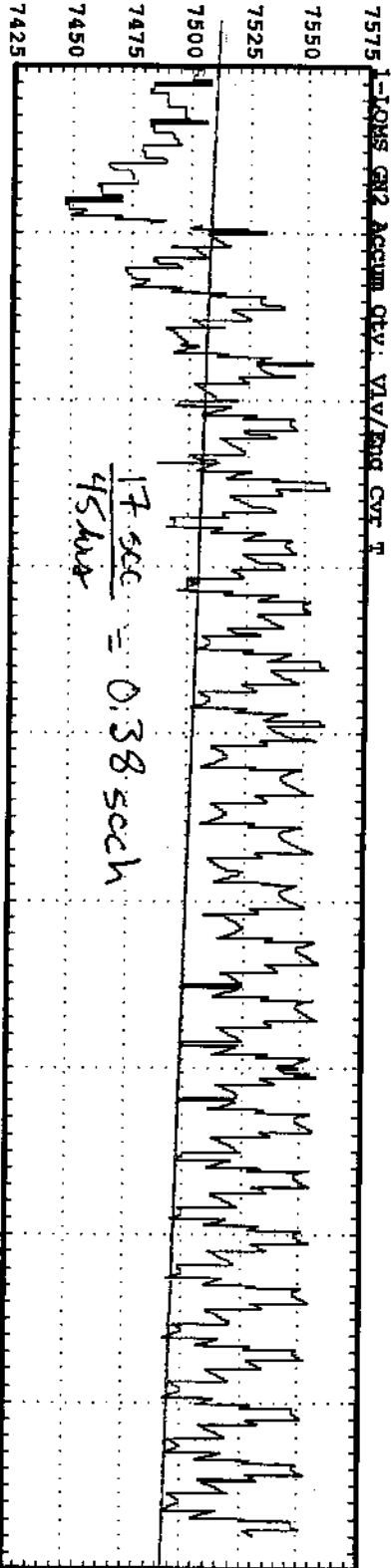
# LEFT ONE ACCUMULATOR GN2 QTY - CALC

M E W S	SAMPLE RATE: 120 (sec/sample)	Subsystem: cms
FORMAT: L GN2 LOW CALC	DATA: GN2 ACCUM	Flight: STS-107

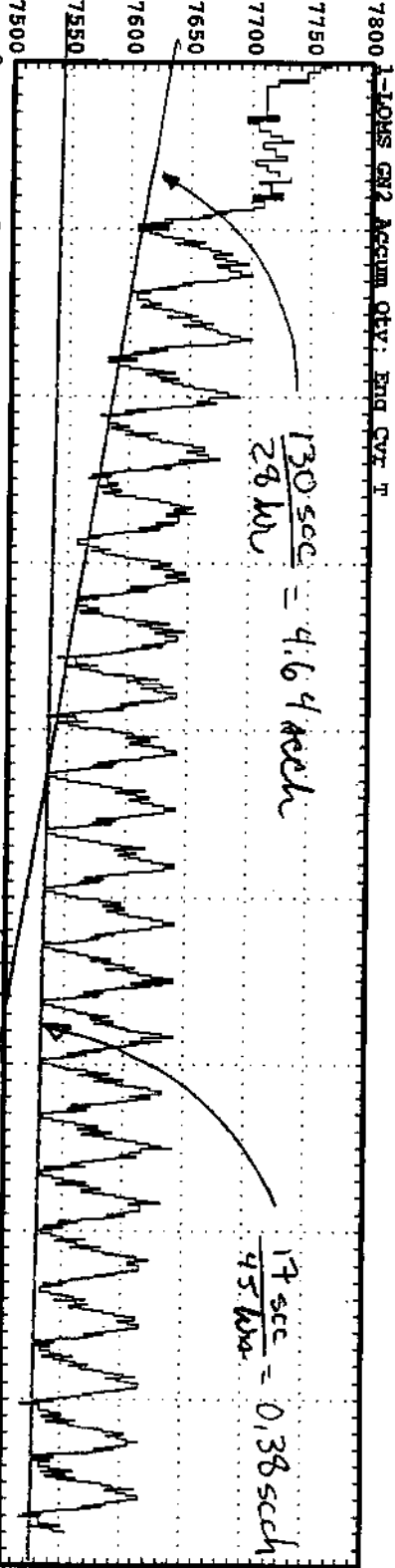
M4304006A  
SCC\_70F



M4304006A  
SCC\_70F



M4304006A  
SCC\_70F



GMT

2003-017:00:00:00.000  
2003-017:05:00:00:00.000  
2003-017:10:00:00:00.000  
2003-017:15:00:00:00.000  
2003-017:20:00:00:00.000  
2003-018:01:00:00:00.000  
2003-018:06:00:00:00.000  
2003-018:11:00:00:00.000  
2003-018:16:00:00:00.000  
2003-018:21:00:00:00.000